Published by Elsevier Inc.

ISSN 0735-1097/04/$30.00
doi:10.1016/j.jacc.2004.05.082

Does it Make Sense to Train Plumbers as Electricians?

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There is an expanded need for implantable cardioverter-defibrillators and cardiac resynchronization pacemakers as part of the treatment of patients with left ventricular dysfunction. A large number of such patients present to heart failure (HF) specialists for recommendations related to their care. In this paper, a pathway is presented that would combine training in HF/transplantation and cardiac implantable electrical devices. (J Am Coll Cardiol 2004;44: 1358–60) © 2004 by the American College of Cardiology Foundation

Cardiac implantable electrical devices (CIEDs) include pacemakers, implantable cardioverter-defibrillators (ICDs), and cardiac resynchronization therapy (CRT) devices (1). In the future, CIEDs will include implantable devices that monitor hemodynamic function. The use of ICDs has increased exponentially secondary to the proven ICD benefit demonstrated in primary prevention trials, including Multicenter Automatic Defibrillator Implantation Trial (MADIT) and MADIT-II. The application of ICDs will increase further once there is dissemination, digestion of the Sudden Cardiac Death in Heart Failure Trial (SCD-HeFT) data, updating of indication guidelines (2), and agreement of reimbursement guidelines. Simultaneous to the rapid growth of ICDs, utilization of CRT and CRT-ICD has created an expanding market for the use such devices in patients with congestive heart failure (HF) and intraventricular conduction disturbances. Approved reimbursement for patients who meet the Comparison of Medical Therapy, Resynchronization, and Defibrillation Therapies in Heart Failure Trial (COMPANION) inclusion criteria will expand the implantation of CRT devices.

Many barriers impede rapid adoption of these new technologies and expanded indications. Some of theses barriers include completion of efficacy trials, Food and Drug Administration approval, guideline committee recommendations from professional societies (2), approval of reimbursement by the Center for Medicare Services and private insurers, and the concern about the cost of these devices. However, the largest ongoing barrier to widespread adoption has been the shortage and maldistribution of electrophysiologists and other cardiac specialists (3–5). The demand for heart rhythm specialists has been taxed further by the simultaneous expansion of complex, longer ablation procedures for ventricular tachycardia and atrial fibrillation. In addition, even electrophysiologists had to suffer through a learning curve to become proficient in CRT implants. The explosion in the number of ICDs and CRT implants and exotic catheter ablation procedures has raised concern that there are not enough heart rhythm specialists to deliver these novel treatments to all patients who may be candidates.

Based on Medicare-age data, about 85% of ICDs are implanted by electrophysiologists. Only 30% to 40% of pacemakers are inserted by electrophysiologists. At this time, most CRT devices are being implanted by electrophysiogists or well-trained device implanters. Given the shortage of electrophysiologists, it has been proposed that HF specialists should help with CIED procedures. The arguments for HF specialist training include added physician manpower to help with device implantations and the fact that HF physicians evaluate a large number of HF patients who may be candidates for such devices. There is the added hope that the ability to place CIEDs might encourage a larger group of trainees to select a HF/implantable device training track with the lure of invasive procedure training to be added to their repertoire.

Adamson et al. (6) presented a proposal for combined training of HF and device implantation. This training track would train HF specialists in device prescription, implantation, and follow-up but would not train them in cardiac electrophysiology. Can this position be supported from an electrophysiologist's perspective? One argument against this proposal is that there are 80% fewer HF specialists than electrophysiologists. Even if all of the current HF specialists and a small group of future cardiology trainees were to be trained in device implantation, only a minor improvement in the device-deficient manpower situation would occur. In addition, this proposal assumes that HF specialists have the time to perform these devices in sizable quantities. Another argument against this proposal is that without cardiac electrophysiology training, would the new CIED-trained HF specialist be adequately trained in the subtle aspects of cardiac electrophysiology and defibrillation threshold testing? From my viewpoint, this latter argument is weak and should not be a hurdle to the adoption of this training track. Besides training in devices, the comprehensive pathway and rotations need to be defined so that there is more homogeneous training of the HF specialist.

The following arguments can be made in support of this training proposal: 1) Fellows in training are not eager to commit themselves to further training in HF because

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Manuscript received May 11, 2004, accepted May 18, 2004.

Abbreviations and Acronyms

CIED = cardiac implantable electrical device
CRT = cardiac resynchronization
HF = heart failure
ICD = implantable cardioverter-defibrillator

there are no procedural gimmicks and the billing is usually low, and this results in lower pay scales, at least in academic settings. The ability to extend training for both HF specialization and CIED implantation would increase the number of trainees interested in this pathway. 2) Although cardiac electrophysiologists may be uncomfortable with another group taking some of their procedures, the reality is that the North American Society of Pacing and Electrophysiology (NASPE) (1,7) and Core Cardiology Training Symposium (COCATS) guidelines (8) rigidly and consistently outline level II training for the placement of CIEDs. Besides the appropriate curriculum, this pathway requires 50 primary pacemaker implantations, 20 pacemaker system revisions or replacements, 100 pacemaker follow-up visits, 25 primary ICD procedures, 10 ICD revisions or replacements, 50 ICD follow-up visits, and 15 supervised CRT implantations. "Although CIED training is commonly attained within the construct of an electrophysiology fellowship with a predefined period of time dedicated to device implantation and management, similar training could be achieved by a specific CIED training experience. For example, this might be accomplished through special training during a sabbatical leave or under the auspices of a recognized mentor" (1). Cardiologists, pediatric cardiologists, and surgeons who are willing to commit to the proper training in this area are not an issue at the specialty society or for local hospital credentialing. Thus, if one develops a training track that adequately trains HF specialists in CIEDs, one could not argue against this concept. The cardiac electrophysiology and cardiology community will not and should not support physicians of any background to just start implanting CIEDs without adequate training. Proper training assures quality assurance and patient safety.

Maybe it is time for more training programs to develop such a training pathway. Heart failure and arrhythmia specialists are working ever closer on clinical trials (SCD-HeFT and COMPANION) and the care of high-risk patients with left ventricular dysfunction. Would there be any takers? I think so, although most cardiology trainees interested in ICDs and CRT probably would prefer a more traditional electrophysiology training pathway, including board eligibility in cardiac electrophysiology. Given the recent specialization of electrophysiologists into ablators, high-end ablators, pacemaker and ICD implanters, and CRT implanters, an alternative training pathway that meets all of the guidelines and consensus statements my be timely.

I would recommend some amendments to the current proposed pathway. Under current Accreditation Council for Graduate Medical Education (ACGME) and COCATS requirements (8,9), general cardiology training requires 36 months of training. Typically, level III HF/transplantation training requires 12 months of training, and cardiac electrophysiology (12 months for board eligibility) plus CIED training (12 months for NASPE, COCATS criteria) requires 24 months of training. Given today's rules, a combined HF/CIED-trained individual should have 24 months of training in addition to 36 months of cardiology. Given the broad knowledge required of an HF specialist, general cardiology training, including level 1 training in cardiac catheterization, echocardiography, cardiac arrhythmias, electrocardiography, critical care, stress testing, cardiac imaging, and consultation, is necessary. There is a proposal to shorten general cardiology training (a return to the short track) to encourage more cardiac specialists, but this may take time to be accepted by all of the regulatory bodies. If a shortened training track is approved in the future, training in HF, cardiac electrophysiology, or combined training can be achieved at a high quality with a shortening of the entire training duration by 12 months.

So it is time to call the question: does it make sense to train plumbers as electricians? Yes, it may be time for more cardiology training programs to develop a pathway for combined HF/CIED training. This pathway should be agreed on in advance by the specialty societies and shared with the accrediting and certifying bodies. If the curriculum is followed, there will be little need for formal board subcertification examinations. Cardiology training programs and specialty societies can be proactive to develop the proper training pathway to ensure patient safety. The alternative of any physician who wants to begin CIED insertion without proper training is not acceptable and should not be encouraged.

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